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By- Greenberger, Ellen; Entwisle, Doris R.

Need for Achievement, Curiosity and Sense of Control: Pilot Study for a Large-Scale Investigation.

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The introduction reviews a number of findings and problems in the measurement of achievement motivation and raises some questions concerning the possible friction between motivation to achieve and curiosity. Subjects for the two pilot studies es were ninth graders of average (95-113) and high IQ (128 +) from a predominantly upper middle-class Jewish, public high school. The first study explores the properties of a set of pictures newly developed to measure need achievement (n Ach). These pictures, separate ones for males and females, display attractive persons in up-to-date academic, vocational, and recreational situations. The results indicate that: (1) the new pictures evoke achievement imagery in amounts and ranges recommended by previous investigators; (2) n Ach scores from these pictures relate somewhat better to grades than scores from other pictures; (3) concern about failure probably interacts with n Ach to affect academic performance; (4) concern about failure seems especially high in average IQ girls and high IQ boys from this milieu; (5) n Ach, curiosity, and sense of control are essentially uncorrelated and are likely to stem from different socialization practices. (Author)

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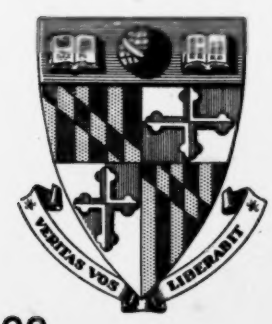

THE JOHNS HOPKINS UNIVERSITY

REPORT NO. 20

THE CENTER FOR THE STUDY OF SOCIAL ORGANIZATION OF SCHOOLS

NEED FOR ACHIEVEMENT, CURIOSITY AND SENSE OF CONTROL: PILOT STUDY FOR A LARGE-SCALE INVESTIGATION

ELLEN GREENBERGER AND DORIS R. ENTWISLE

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JULY 1968

NEED FOR ACHIEVEMENT, CURIOSITY AND SENSE OF CONTROL: PILOT STUDY FOR A LARGE-SCALE INVESTIGATION[1]

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Ellen Greenberger and Doris R. Entwisle

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The Johns Hopkins University
Baltimore, Maryland

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ERRATA

Table 9 was mistakenly inserted on the page <u>following</u> Table 10.

The material on page C-4 of Appendix C should be read immediately after page C-1.

OVERVIEW

This report represents the first step in a larger project which will examine the need to achieve, curiosity, sense of control, and a number of other variables across four SES groups.

The Introduction reviews a number of findings and problems in the measurement of achievement motivation--especially, issues that touch upon the validity of McClelland's n Ach (need achievement) measure. Questions also are raised concerning the possible friction between motivation to achieve and curiosity--an interest in knowing and finding out for its own sake.

The remaining two sections present two phases of the pilot project, which was based on middle to upper-middle class ninth-graders. Study 1 elaborates on two problems in research on n Ach: the instrument (a set of pictures) itself; and the relationship of n Ach scores to measures of performance. Study 2 describes the relations among sex, IQ, n Ach, curiosity and locus of control for success and failure in intellectual and academic matters (Crandall's IAR Scale).

Introduction

This is an achievement-oriented society, for better or for worse. Psychologists measure in a variety of ways the motivation to achieve, educators measure, also in various ways, the academic achievement of their pupils, and parents in great number are concerned both with their youngsters' external school record of accomplishment and their internal, more generalized need to do well. This paper is concerned with problems in one measure of the need to achieve and with the larger problem of defining other valuable motivational forces or cognitive styles which the society and the school perhaps tend to overlook.

McClelland's (1953) development of a projective measure of achievement motivation, based on analysis of stories written in response to a set of pictures, has led to the accumulation of a substantial body of literature and a number of very interesting findings.[1] We know, for example, that boys scoring high on the need to achieve (hereafter abbreviated to n Ach) have experienced earlier independence training and more

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[1] A brief outline of McClelland's scoring scheme for measuring the need to achieve is given in Appendix A.

affectionate rewards for success in efforts at mastery than boys who score low in n Ach (Winterbottom, 1958); and that adolescent girls' achievement stories, more than those of boys, are concerned with winning approval as a consequence of achieving, whereas boys' stories focus more on their feeling of competence after doing well (Crandall, 1963).

A considerable number of studies have demonstrated a relationship between n Ach scores based on imaginative material and the nature, quality, or quantity of performance in actual life or laboratory situations. Comparing people who score high on n Ach with those who score low, the former more often set goals of intermediate difficulty, the attainment of which requires genuine striving and ability (rather than luck or only the slightest effort, as in the case of extremely high and extremely low goals, respectively) (Atkinson and Litwin, 1960; Clark, Teevan, and Riccuti, 1956; Mahone, 1960; McClelland, 1958); and prefer playing a game of skill to a game of chance, even when the odds of winning are identical. And McClelland (1966) recently has reported increments in academic performance and in entrepreneurial activity after training designed to increase achievement motivation, and consequently, n Ach scores. Studies which reveal significant relationships between n Ach scores and performance variables are very important, since McClelland maintains that there is a direct relationship between fantasies of achievement (n Ach) and "actual" achievement behavior; as a man fantasies, so he

does. Put another way, the validity of his theory and measure of achievement motivation depends on positive outcomes of research relating n Ach to performance.

This is not to say that high n Ach will always be highly and invariably related to successful or otherwise outstanding performance (Atkinson, 1964). Among the many factors which may interfere with such a relationship are the individual's ability to perform a given task, regardless of achievement motivation; the incentive value of turning in a good performance (S may not perceive successful completion of the particular task as a source of achievement-satisfaction); and the operation of motives other than n Ach on the performance in question, thereby confounding differences in accomplishment due to differences in n Ach. (For example, if the task is very routine and onerous, such as cancelling all the "e's" in a manuscript during a given time period, differences in the need to please or earn approval may have more to do with the quality and quantity of performance than the need to achieve.) Consequently, as Klinger (1966) has pointed out, "relationships between n Ach and performance measures should be at most moderate, and perhaps low...". Research on n Ach and performance often has not been sensitive to these issues.

The predicted association between n Ach and performance runs into its severest troubles in research which relates achievement motivation to academic performance (grades) and to problem-solving tasks presented in the laboratory. In a

recent summary of a large number of studies relating n Ach to performance, Klinger (1966) has observed that n Ach scores relate better to long-term behavior sequences than to short-term sequences i.e. course grades as opposed to laboratory tasks; and that associations are stronger for high school than college age Ss and for males than for females. In light of the problems cited above, the long vs. short term difference in fact may be due to the low achievement-motivational "pull" of many laboratory tasks. The fact that correlations between n Ach and grades or laboratory tasks when significant are of modest size undoubtedly reflects the influence of many other variables, as suggested earlier. That n Ach is more often associated with grades at the high school than at the college level may be attributable to the greater heterogeneity of high school samples: the n Ach scores of students who attend college very likely fall within a narrower range. That the results for females look worse than those for males (i.e., more nonsignificant than significant findings) may be due first to the fact that the studies of high school females summarized by Klinger focus almost exclusively on short-term performance in laboratory situations; and second, to the rechanneling of the need to achieve of a good many college women towards goals other than academic ones, in accord with the ambivalence this society feels towards intellectually achieving women.

An additional factor, largely neglected up to now, may

hold down the magnitude and breadth of associations between n Ach and performance: the very pictures themselves from which n Ach scores are obtained. In a great many pictures used for assessing n Ach (e.g. Veroff, Atkinson, Feld and Gurin, 1960)[1] picture content does not seem relevant to the probable achievement goals of the Ss, and the central figures are both unattractive and outdated in appearance. To put the matter concretely, in this day and age, does a picture of a painfully plain-looking woman kneeling to upholster an old-fashioned wing chair really "turn a girl on"? The example is not chosen at random. The pictures used for female Ss seem especially guilty of old age--and it is for female Ss that n Ach scores show least validity and a number of additional vagaries (see summaries of these other problems by Lesser, Krawitz and Packard, 1963; and by Alper and Greenberger, 1967). The questions just raised must be answered empirically at some point. They reduce to the following two: are n Ach scores based on pictures with attractive persons more valid than those based on unattractive figures? and are pictures with content similar to one's own achievement goals the basis of more valid n Ach scores than pictures whose achievement goals are remote?

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[1] A sample of these pictures is reproduced in Appendix B

While on the one hand the properties of McClelland's n Ach measure need further investigation, so do the definition and measurement of other personality or cognitive variables that relate to school performance, job performance, and the ability to work with ideas. McClelland (1964) and others have discussed with concern the pervasive emphasis in this society on wanting to achieve. The achievement motive, based on the anticipation of pleasurable affect consequent upon meeting high standards of performance, is unquestionably of value in a society such as ours. But what is the effect of the unmitigated approval and reinforcement of the desire to succeed on the development of other forms of excellence? What, for example, happens to curiosity in an environment that is so concerned about end-products, and so selectively reinforcing of a good end-product--an achievement? Curiosity--involving openness to unusual experience, wonder and interest in it, attempts to categorize novel experience and incorporate it into one's map of the world--may or may not have a recognizable (and therefore reinforceable) outcome, or a "good" outcome. Often the curious person can not succeed in finding out what he wants to know. If youngsters are overly concerned with achievement, curiosity may be curtailed, especially curiosity which is not instrumental to an achievement goal: i.e., finding out for its own sake.

Compared to research on achievement motivation, research on human curiosity is still at an early stage, and particularly

so in its assessment procedures. However, evidence is growing which suggests that curiosity is a valuable orientation to preserve and to nurture. Research indicates that satisfaction of curiosity increases the amount of learning (Berlyne, 1954) and constitutes a sufficient reward, even in lower animals, to bring about learning (Butler, 1953). Furthermore, highly curious children appear to differ from children low in curiosity in a number of important ways: they have more general information about the world in which they live, persist longer at problem-solving, and rate higher in self-sufficiency as well as in the assumption of responsibility for group welfare (Maw and Maw, 1964-65).

The problems and findings which have been discussed up to this point, and the two studies to follow, are the initial steps in a large-scale investigation of n Ach, curiosity, and their relationship to each other and to other variables. The larger project will cover points from the pre-school years through high school (Entwisle and Greenberger, 1967; 1968). The remainder of this report has two aims: the presentation and analysis of a new set of pictures for measuring n Ach (Study I); and an initial exploration of hypotheses concerning n Ach, curiosity, and another variable of concern to us--sense of control (Study II).

STUDY I

As discussed in the Introduction, the relationships between n Ach and performance in school and on laboratory tasks of problem-solving so far have been less than impressive. The question was raised: despite the fact that performance in these areas is affected by many variables other than n Ach, will the degree of relationship improve with the use of pictures showing more attractive people involved in activities that are more self-relevant to the story-teller? Possibly, such pictures may evoke more accurate projections of the Ss' own achievement wishes and efforts and thereby yield n Ach scores which show stronger relationships to measures of "actual" achievement.

Method

Design of pictures

Attractive models were selected and posed in situations which presumably should tap achievement fantasies in a variety of male and female role-relevant achievement domains: for girls, school, work, and social domains; for boys, school, work and athletic pursuits. Since our large-scale investigation involves youngsters at all socio-economic levels and

several ability levels, pictures of two work situations that differ in social class and ability connotations were included. The major consideration underlying the design of these pictures was the extent to which they suggested stories about achievement. Prior work on the optimum cue strength of pictures suggests that from 30% to 70% of the stories told to each picture should contain achievement imagery in some degree (Haber and Alpert, 1958). This range insures that pictures are not so highly or so minimally suggestive of achievement themes that individual differences in the amount of achievement imagery are masked.

Eight pictures for boys and eight for girls were selected for testing from among over 500 photographs taken. The four pictures pre-judged as most promising form Series I for both sexes; the Series II pictures are the remaining 4 pictures for each sex. A brief description of all 16 pictures is given in Table 1. Two pictures are reproduced in Appendix C.

Subjects

Ss were 130 ninth-grade boys and girls, the great

majority of Jewish background, in an upper middle class suburban school. All students in eight study halls were tested, and the sample was formed subsequently on the basis of IQ. Ss were selected to form average and high IQ strata as follows. Ss whose latest IQ score was between 95 and 113, and whose previous testing had never fallen above 113, were put into the Average IQ stratum. Ss whose latest IQ score was 128 or above joined the High IQ stratum. (Ss who were absent for other test procedures, to be described in Study II, were not included in the samples.) Because of the limited number of youngsters who met the High IQ criterion, it was not possible to complete the desired 8-cell design (IQ x sex x Picture Series), and there are no data for High IQ Ss with Series II pictures. IQ data for the resulting six groups are given in Table 2.

Procedure

Prior to testing for achievement motivation, Ss had written stories to another set of pictures (described in Study II) for other purposes, and had answered part of Crandall's IAR Scale (also described in Study II). The new n Ach pictures were tried out in the second of two test sessions under McClelland's (1953) achievement-oriented condition with very slight modifications in the instructions and the time allotted. Ss were group tested in intact study

halls by female examiners. Series I and Series II booklets were handed out at random.

Briefly, the achievement-oriented condition involves telling Ss that they are about to do some tasks which measure their intelligence and potential leadership ability. The first is an anagrams task, the second a scrambled words procedure. These tasks are followed immediately by the writing of stories to pictures, a task which is explained as a "test of creative imagination". The complete test materials worked on in this research session may be found in Appendix C.

Scoring for n Ach was done by one of the authors (EG) an experienced scorer, according to the McClelland (1958) manual. The number of correct anagrams provides a performance measure of short-term problem-solving in the laboratory. The scrambled words task is traditionally used as an arousal procedure and not a performance measure.To obtain a measure of long-term performance, grades were secured for the immediately preceding term in the two courses, English and Social Studies, taken by all 9th grade students. Letter grades in the two courses were assigned a numerical value (E = 1, D = 2, ... A = 5) and summed to give a single score.

Results

Analysis of pictures.

Table 2 shows the amount of n Ach imagery evoked by each

picture in Series I and II. Overall, the pictures functioned very well, evoking imagery in the desired 30% - 70% of stories and producing a good distribution of n Ach scores. Only one pictures fell short of the desired lower limit (30%) in evoking achievement-related stories, and also had a low mean n Ach score: Female Series II Picture 2. The low percentage of achievement-related stories told to this picture may be due to the fact that typing and/or secretarial work is not high in the goal-hierarchy of girls from an upper-middle class Jewish subculture. Results for this picture may be quite different when children of other social class and ethnic backgrounds are tested, as is planned in our large-scale investigation. The same reasoning applies to male Picture 2 of Series I for high IQ boys where a shop scene elicits a small percentage of imagery, although with average IQ boys this picture is satisfactory.

Differences in how IQ and sex affects responses to pictures are suggested by Table 2. For girls, IQ seems to exert little influence on the selective effectiveness of picture cues to trigger achievement fantasies: differences in mean

scores, ranges, and per cent imagery are small between average and high IQ girls, with the possible exception of the classroom scene. IQ does seem to have a strong selective effect, however, on the occurrence of achievement fantasies in boys. Average IQ boys give more achievement imagery to Picture 2 (Printshop) and Picture 3 (Baseball) than do high IQ boys, both almost significant at the 5% level. The sexes can be compared directly within each Series on Pictures 1 and 4, the classroom and laboratory pictures. For combined IQ groups, boys give more achievement imagery to the Series I version of the classroom picture, whereas the girls give more to the Series II version, although the differences do not attain significance. These differences, if substantiated in future work, may reflect differences in the ways in which boys and girls tend to achieve: via independence of thought and action (as suggested by the freedom of the youngster with head up in Series I who is not looking at the assignment) or via conforming to the expectations of others (as suggested by the head down, nose-to-the-grindstone position in the Series II classroom picture. Differences on Picture 4 are small, with a slight (non-significant) tendency for average IQ girls to exceed average IQ boys in the production of achievement fantasies to both versions of this picture.

A final set of pictures for use in our large-scale investigation was selected on the basis of information from this study. The pictures are 2, 3, and 4 from Series I for

males and females and Picture 1 from the male and female Series II. Considerations other than per cent and distribution of imagery were: (1) The Series I version of Picture 2 for both sexes contains a Negro, a useful factor since we will be testing Negro Ss; (2) In responding to Picture 3 in the male Series II, many boys identified with the defendant rather than the lawyer, which causes this picture to evoke crime rather than achievement imagery; (3) Picture 3 in female Series I is easier to score than the Series II version (it is clearer whether the imagery deals with a genuine achievement goal or with a more or less routine task); (4) Picture 4 of both female series produced similar results, and the Series I version was chosen to preserve comparability with the male version.

The only real dilemma occurred in the choice of Picture 1, the classroom picture, for both sexes. By choosing Series I for boys and Series II for girls (the "obvious" choice) we would have lost the opportunity to use more or less the "same" picture for both. We selected the Series II pictures, favoring a picture which is "good" for girls, because results of n Ach studies with girls often have failed to yield predicted relations with performance variables. This turned out to be a good choice in other respects, since subsequent examination of how scores on each picture related to academic performance showed that the Series II version of Picture 1 was superior to the other classroom picture for both boys and girls.

The results reported below, and in Study II, are based only on the Series I pictures, because of the incomplete IQ sampling available for Series II. Series I includes 7 out of 8 pictures selected for use in further work.

Relation of n Ach scores to performance measures.

N Ach scores were related to performance on the anagrams task and to the sum of English and Social Studies grades. Unless stated otherwise, "n Ach score" means the sum of four scores for Series I, with its separate versions for male and female Ss. Positive associations between n Ach and performance were predicted for all sex and IQ groups. Table 3 summarizes the findings, and also lists separately the grades obtained by the four groups of Ss.

Beginning with the anagrams, we find for average IQ boys and girls significant and fairly strong positive associations with n Ach score. For high IQ females, there is a negligible positive association, the attenuated association due perhaps to the fact that high IQ girls had uniformly high scores on anagrams, with a range from 12 to 42 words and a mean score of

24 words; whereas average IQ girls have a mean of 12 and a range of 1 to 24 words.[1] For high IQ males, the relationship is significantly negative. The range of scores is from 6 to 29, with a mean of 19 words, which suggests much lower effort than was expended by girls of comparable IQ. By way of explaining the inverse relationship between n Ach and anagrams performance, it is possible that very bright boys who are highly achievement-motivated view the anagrams task as trivial and do not spend much effort on it, while the very bright boy with less concern over the unusual achievements he can attain is willing to take this mundane task more seriously.

The correlation of n Ach scores with the summed English and Social Studies grades is significant, and highly so, for only one group: high IQ girls. The relationship approaches significance for average IQ boys, but not for the remaining two groups. Overall, the relationships observed are about the same magnitude as reported in previous research or slightly better.[2] (The result for high IQ girls is unusually

1 Average boys perform much like average girls: the range is 7-21, with a mean of 12.

2 For example, Morgan reports correlations ranging between .16 and .45 for sophomore grade average and n Ach among students in academic high schools and correlations from .04 to .31 for Ss in vocational high schools. The lowest correlation acceptable at the 5% significance level is .29 (Morgan, H.H., "Measuring achievement motivation with 'picture motivations,'" J. Consult. Psychol., 1953, 17, 289-292). Ricciuti finds low but significant correlations from .23 to .33 between junior grades and nAch for academic high school Ss. Adjusted for ability, the range of r's is .16 to .29. (Ricciuti, H.N., The prediction of academic grades with a projective test of achievement motivation: I. Initial validation studies. Princeton: Educational Testing Service. June 1954). Our sample may be thought of as coming from an academic high school; and since nAch-grades analyses were made separately for average and high ability groups, we have in a sense correlations corrected for ability.

strong.) For high IQ boys, the absence of association (it is very slightly negative) may be due in part to the small n and the small variability in grades for this group.

Discussion

The point has been raised before (e.g., Klinger 1966) that relations between n Ach and performance may be non-linear and non-monotonic. If this is the case, linear correlation coefficients tend to depress the observed degree of association and in fact to obscure the true pattern of relationships. Table 4 displays the mean n Ach score of Ss at each level of grade-attainment, from highest (10 = 2 A's; 9 = 1 A and 1 B, etc.) to lowest. For high IQ girls, there is a quite orderly increase in mean n Ach score as grades go up. For average IQ boys, the same holds true up to a point: the mean n Ach score does not rise from grades of 7 through 9. Perhaps other motives, such as desire for approval or other variables mentioned earlier, operate in the attainment of the higher grades within this group of Ss. High IQ boys and average IQ girls show a shared kind of difference in the

patterning of n Ach and grades. It is evident that a considerable number high n Ach scorers in these two groups are getting low grades. Broken lines have been drawn in columns 2 and 3 of Table 4 to show where a steady increase in n Ach with increasing grade-attainment begins to take place.

How can the two blatantly nonsignificant results be explained? Atkinson's (1964) model of achievement behavior may be of use. This model describes behavior in achievement-related situations as a function of two motives: the motive to approach success and the motive to avoid failure. The first produces positive interest in and active pursuit of success; the second blocks achievement by steering the individual away from achievement-related activities and/or inhibiting responses which are necessary for achievement but which it is feared might lead to failure. In other words, the motive to avoid failure "subtracts from" achievement motivation and diminishes the level of performance.[1] It is possible that average IQ girls and high IQ boys from this subcultural milieu have heightened anxiety about failing. The former, because of their average ability, may have difficulty doing very well in a school whose mean IQ is above average

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[1] More will be said about Atkinson's model at the end of the Discussion.

and whose subculture is very concerned about academic achievement. With girls' presumably greater desire for approval, they may develop more anxiety about failure than boys of similar ability. Anxiety about failing also may be acute for high IQ boys, since teachers and parents have high expectations of them. (It is interesting that these boys in fact get few A's.) In the absence of a better measure of the motive to avoid failure, the stories were examined for failure themes. High IQ boys mention twice as many clearcut failures as average IQ boys, and these themes tend to cluster among boys getting the <u>lowest</u> grades (7 and below). Samples from the stories of high IQ boys follow:

-He can't cope with school, so he kills himself.

-He will fail because he's dumb, due to a concussion he got in an accident.

-He fails a test and flunks out of school.

-He dropped out of school because he was too smart, but when he made an important discovery, no one would believe him.

-He is hoping to impress the girls with a home run. He strikes out.

A similar analysis of average and high IQ girls' stories suggests less of a difference in sheer number of failure themes,

but a tendency for average IQ girls, more often than the abler girls, to locate failure themes in stories about the classroom. The anxiety-about-failure hypothesis seems more strongly supported for high IQ boys than for average IQ girls.

We return now to the question, <u>can relationships between n Ach and performance variables be improved by the use of more attractive, up-to-date pictures</u>? Evidently not by means of good pictures alone. It seems essential to forsake the pursuit of simple, linear relationships and to develop a more complex model of achievement behavior based on <u>n</u> Ach, anxiety about failure, IQ level and perhaps other variables as well.[1] Research utilizing <u>n</u> Ach scores in interaction

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[1] Atkinson has made significant progress in building a model of "available" achievement motivation. Briefly reviewed,

$$\text{Achievement Motivation} = \underline{n}\ \text{Ach} - \underline{n}_{af}\ (P_s \times I_s),$$

where <u>n</u> Ach is a 4-picture <u>n</u> Ach score; $\underline{n}_{af}$ is a measure of the motive to avoid failure--namely, the Mandler-Sarason Test Anxiety Scale; P_s is the <u>S</u>'s estimate of the probability of success; and I_s is the incentive value of success, which is set equal to $1 - P_s$. It can be seen that available achievement motivation is greatest under conditions of intermediate probability of success. (Recall findings cited in the Introduction concerning preference of high <u>n</u> Ach people for goals of intermediate difficulty.) Intuitively we make the guess

with a measure of test anxiety (reviewed in Atkinson, 1964) already has begun to yield a promising and consistent body of findings.

STUDY II

The second phase of the pilot project investigated the relations among n Ach, curiosity, and sense of control.

In the Introduction, a possible incompatibility between n Ach and curiosity was suggested, However, these two dispositions do have some basic shared features: namely, an active orientation to the world and a striving to master (tasks vs. unusual stimuli). One of the two scoring schemes for curiosity, furthermore, is based on the n Ach skeleton scoring system. Consequently, we predicted a low to modest positive relationship (at best) between n Ach and curiosity.

We also expected that at very high levels of n Ach, n Ach and curiosity would be inversely related. A high degree

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that more attention to the incentive value of success (I_s) as a factor which can be evaluated independently of P_s may prove fruitful. (As suggested in the Introduction, some tasks or goals simply may not seem important to S, and the resulting I_s would be low regardless of P_s.)

of concern about succeeding seems at odds with an attitude of openness to and interest in novel stimuli, many of which are irrelevant to achievement goals. This prediction can only be explored tentatively because the number of Ss available in the pilot study is inadequate for a meaningful test.

The third prediction is that n Ach will be positively related to an internal locus of control regarding success and failure in intellectual-academic efforts. Pleasure in success (achievement) seems more likely if success is attributed to one's own efforts rather than to luck or the efforts of others; and anticipated pleasure following upon success is theoretically a major force in the development of n Ach. A sense of personal responsibility for failure seems logically related to a concern with doing better or living up to internalized standards of excellence. Since both success and failure concerns may trigger achievement strivings in fantasy, the prediction is that the higher the sum of scores for both kinds of internal responsibility, the higher the n Ach.

In addition we wished to explore a number of other matters of interest, about which no predictions were made: (1) possible sex and IQ differences in curiosity and sense of control regarding intellectual-academic success and failure; (2) relations between curiosity, sense of control, and grades; and (3) the degree of correspondence between two somewhat different measures of curiosity.

Method

Subjects

Ss were 9th grade students, whose characteristics and selection have been described in Study I. The number of Ss is not constant for all hypotheses or relationships tested. For comparisons involving n Ach, only Ss who took the Series I pictures are used, and so the resulting n's are smaller than for comparisons in which n Ach is not involved. In the latter cases, we use the entire sample. The n's used in any comparison are shown in the relevant Tables.

Procedure

Ss were tested in intact study halls by female examiners. Two test sessions took place, approximately one week apart. The examiners introduced themselves as a group of researchers from the Johns Hopkins University who were conducting a project in many schools in the greater Baltimore area.

In the first session Ss wrote stories to six pictures cued for curiosity themes. The first four pictures are used for obtaining two different curiosity scores, each to be described shortly. Ss also answered 17 items from Crandall's IAR scale, tapping locus of control for intellectual-

academic success and failure (Crandall, et. al., 1965). The remaining Crandall items were answered in the second session, after the n Ach procedure. The curiosity story-writing task was introduced as an attempt to see "what kinds of stories boys and girls your age can make up when they really let their imagination go". The instructions were intended to reduce any stress or feeling of being tested to a minimum.

Four pictures devised by Beswick (1965) were used to elicit stories on which curiosity scores were based. They show (1) an inventor in his laboratory with a large light-bulb in front of him (often seen as Edison); (2) a man in his study holding an ambiguous object (often seen as a rock or bird) in his hand; (3) a radio-telegraph operator at a large console; and (4) two boys on a beach, one bending to pick up a bottle. Two other pictures devised by us were not included in the final score. They are being evaluated, along with other new ones used in subsequent samples, for possible use in future studies.[1]

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[1] The Beswick pictures are of poor photographic quality and show rather stereotyped situations.

Samples of test materials used in this first research session may be found in Appendix D. Testing for n Ach and the remainder of the Crandall Scale took place in the second session, as described in Study I (materials in Appendix C.)

Scoring

Beswick provides a "wide net" scoring scheme that catches various expressions or forms of curiosity. The scoring system is based on the theory that curiosity involves both openness to and seeking of unusual stimuli, and the ordering or incorporation of these experiences into one's cognitive map or category system. The scoring system described in Table 5 is an adaptation of his (1965) scoring rules suggested by Beswick (personal communication, 1967). A small amount of data pertinent to the validity of his measure is reported in Beswick's (1965) dissertation.

Each story is given from 0 to 5 points, one each for any of five kinds of curiosity imagery present. The final score

is the sum over four stories. 80 stories from another research investigation were scored independently by two raters, with interscorer reliability near .90. The present set of stories was scored jointly, in order to maximize accuracy and discuss implicit aspects of the scoring scheme.[1]

Greenberger has adapted the skeleton scoring system for motives developed by McClelland et al. (1953) to obtain a more narrowly defined measure of curiosity, namely, the "need to know". A preliminary attempt to validate this measure was promising, though not definitive (Greenberger, 1966). Stories are scored zero unless they contain evidence of wanting to find out, learn, locate problems, or solve problems. (The relevant imagery is very similar to Beswick's Cognitive Acts.) Stories containing such imagery are then scored further for the other categories listed in Table 6.

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We are grateful to Jeanne O'Connor for her high level of skill in helping to score these stories and to her and Barbara Bricks for other services as research assistants on this project.

There is one addition to the McClelland skeleton scheme: Ex., or excitement about "finding out". The range for each story is from 0 to 12 points, rather than McClelland's -1 to 11. S's total for the need to know is the sum of scores for 4 pictures. Scoring was done by one of the authors alone, without knowledge of Ss' scores on other variables. A manual is planned so that in the future protocols may be scored independently by other raters.

Results

Overall relationship between n Ach and curiosity.

A variance analysis based on a factorial design with sex, high vs. average IQ, and above or below the median in n Ach reveals no significant effects. As Table 8, shows, relations between n Ach and curiosity are low positive, thereby confirming the hypothesis of a moderate association

"at best" between n Ach and both the Beswick and Greenberger definitions of curiosity.

Relationship between extremely high n Ach and curiosity.

The size of the present sample is not large enough to provide a good test of the hypothesis that predicts an inverse relationship. If, however, the three highest-scoring Ss on n Ach are selected for each sex-IQ group and their curiosity scores are examined, there is no consistent pattern; i.e., there are about the same number of high achievement-scoring persons above and below the median on both curiosity measures. This hypothesis obviously needs to be re-examined when more data are available.

Inspection of the other end of the distribution, incidentally, yields the finding that the three very lowest scorers on n Ach for each sex-IQ group are low scorers on the Beswick measure (but not on the Greenberger measure), suggesting that further analysis of extreme scorers on n Ach may be worthwhile when additional data are available.

n Ach and locus of control for intellectual-academic success and failure.

Table 8 shows the correlations between n Ach and three other measures: the sum of scores for internal locus of control for success and failure, and for the success and failure subscales separately. Only high IQ boys show a large and significant correlation between need Achievement and the total Crandall score. The failure subscale, taken alone, does not show any significant relationships with n Ach; there is a positive association between the success subscale and n Ach for the high IQ boys.

Other findings.

n Ach. As indicated in Study I there are no differences in level of n Ach attributable to IQ, for this perhaps "special" sub-cultural group of upper middle-class children. Differences in the particular situations which trigger achievement fantasies were reported in Study I .

Curiosity. The correlation between the Beswick and Greenberger scores for 78 Ss is .58; addition of the 45 Ss used for obtaining Series II n Ach scores (all of average IQ) barely changes the correlation, which is .60, significant beyond the .01 level. The basic data for the Beswick and

Greenberger curiosity scales are summarized in Tables 8 and 9. Aside from the fact that the two scales have different means and standard deviations as would be expected from the different ranges of scores possible for each (Table 9), they show approximately the same pattern of relationships with other variables. Variations may show up, however, with a larger n, as suggested by the finding that Ss with very low n Ach score differently on these two measures. For average IQ males, there is a significant correlation between the Beswick score and grades (Table 9) and the Greenberger scores show a relationship in the same direction that does not attain statistical significance. For females, curiosity and grades show virtually no or negative relationships.

Crandall's IAR Scale. The success and failure subscales of the Crandall Scale, each consisting of 17 items, are reported to be only mildly related (Crandall, et al., 1965). Our results confirm this mild association for students of average

IQ ($r = .31$, $p < .05$). We observe a much stronger association, however, between the two subscales for high IQ students ($r = .58$, $p < .05$).

Mean scores on the success scale are all higher than those on the failure scale, as shown in Table 10. There are no consistent differences between average and high IQ students on the two scales except those associated with sex. For average IQ students, girls score significantly higher than boys on sense of control over failure ($t = 2.68$, $p < .05$), but not on the success scale. Although the sex difference for the failure scale fails to attain significance for high IQ students considered alone, when IQ groups are combined this sex difference still attains significance because the direction in the high IQ group duplicates that in the average IQ groups.

Relations of the Crandall scores to n Ach already have been discussed. Looking now at the relations between locus of control and curiosity, in no case is the small positive correlation between either curiosity measure and the Crandall

scale significant. (Correlations with the scales taken separately range from .00 to .16).

Discussion

The variables n Achievement, curiosity, and sense of control seem largely independent within this sample and probably are the result of quite different aspects of socialization. The fact that there are no sex or IQ differences in mean curiosity scores may be due to inadequacies in the scoring schemes[1] or to certain characteristics of the curiosity procedure itself. Sex differences perhaps are less likely at the level of imagination and story-writing than at the level of manipulation, tinkering or doing.

While curiosity is not, in general, significantly related to grades, it is interesting to observe that the relations are stronger for male than female Ss. For male Ss, the association is slightly higher than that between n Ach and grades. A closer look at the data for each sex-IQ group

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[1] Teacher ratings of students' curiosity will be available shortly to compare with curiosity scores based on the story-writing procedure.

should indicate whether a weighted score based on curiosity and n Ach might be of value.

The findings on the Crandall scale provide some additional support for conjectures raised in Study I. There it was suggested that average IQ girls and high IQ boys may have especially great concern over failure. Although evidence from the achievement stories was weak in the case of average IQ girls, they obtain the highest score of any group on the subscale measuring sense of responsibility for failure. Conversely, the high IQ boys, whose stories were so filled with blatant themes of failure and who, it was argued, are subjected to strong achievement pressure, tend to project responsibility for failure onto others.

PROSPECT

The large-scale investigation we plan will profit in a number of ways from the pilot studies described in this report. Specifically, we plan to:

(1) use pictures for measuring n Ach selected on the basis of Study I.

(2) employ, for the time being, ways of scoring two types of curiosity because they may show somewhat different relationships to other variables (Study II)

(3) include a measure of anxiety about failure--specifically the Mandler-Sarason Test Anxiety Scale. Past research and present results indicate an interaction between n Ach, anxiety about failure, and performance. The large-scale study will provide interesting descriptive data on the level of test anxiety in different SES groups, and on the particular sex-IQ subgroups where heightened test anxiety is felt.

References

Alper, T. G. and Greenberger, E., "Relationship of Picture Structure to Achievement Motivation in College Women", Journal of Personality and Social Psychology, 1967, 7, pp. 362-371.

Atkinson, J. W., An Introduction to Motivation, New York: New York: Van Nostrand, 1964.

Atkinson, J. W. and Litwin, G. H., "Achievement Motive and Test Anxiety Conceived as Motive to Approach Success and Motive to Avoid Failure", Journal of Abnormal and Social Psychology, 1960, 60, pp. 52-63.

Battle, E. S. and Rotter, J. B., "Children's Feelings of Personal Control as Related to Social Class and Ethnic Group", Journal of Personality, 1963, 31, pp. 482-490.

Berlyne, D. E., "Knowledge and Stimulus Response Psychology", Psychological Review, 1954, 61, pp. 245-254.

Beswick, D., "Theory and Measurement of Human Curiosity", Cambridge: Harvard University, unpublished doctoral dissertation, 1965.

Beswick, D., personal communication, 1967.

Butler, R. A., "Discrimination Learning by Rhesus Monkeys to Visual-Exploration Motivation", Journal of Comparative Physiology, 1953, 46, pp. 95-98.

Clark, R. A., Teevan, R. and Ricciuti, H., "Hope of Success and Fear of Failure as Aspects of Need for Achievement", Journal of Abnormal and Social Psychology, 1956, 53, pp. 182-186.

Crandall, V. C., Katkovski, W. and Crandall, V. J., "Children's Beliefs in Their Own Control of Reinforcement in Intellectual-Academic Achievement Situations", Child Development, 1965, 36, pp. 71-109.

Crandall, V. J., "Achievement", in H. Stevenson (ed.), The Sixty-Second Yearbook of the National Society for the Study of Education, Part I, Child Psychology, Chicago: University of Chicago Press, 1963, pp. 416-452.

Entwisle, D. R. and Greenberger, E., Quarterly Report, Dec. 1, 1967, Center for the Study of Social Organization of Schools, The Johns Hopkins University (mimeo).

Greenberger, E., Informal talk at Mills College, May 1966 (mimeo).

Greenberger, E., and Entwisle, D. R., Pictures for measuring n Achievement in high school and college age Ss, copyright pending, 1968.

Haber, R. N. and Alpert, R., "The Role of Situation and Picture Cues in Projective Measurement of the Achievement Motive", in J. W. Atkinson (ed.), Motives in Fantasy, Action and Society, Princeton: Van Nostrand, 1958, pp. 644-663.

Hechkausen, H., The Anatomy of Achievement, New York: Academic Press, 1967.

Klinger, E., "Fantasy Need Achievement as a Motivational Construct", Psychological Bulletin, 1966, 66, pp. 291-308.

Lesser, G. S., Krawitz, R. N. and Packard, R., "Experimental Arousal of Achievement Motivation in Adolescent Girls", Journal of Abnormal and Social Psychology, 1963, 66, pp. 59-66.

Mahone, C. H., "Fear of Failure and Unrealistic Vocational Aspiration", Journal of Social Psychology, 1960, 60, pp. 253-261.

Maw, W. H. and Maw, E. W., "Differences between Children with High and Low Curiosity: A Summary," Moravia, New York: Chronicle Guidance Publications, Inc., 1965-66.

McClelland, D. C., Atkinson, J. W., Clark, R. A., and Lowell, E. I., The Achievement Motive, New York: Appleton-Century-Croft, 1953.

McClelland, D. C., "Risk Taking in Children with High and Low Need for Achievement", in J. W. Atkinson (ed.), Motives in Fantasy, Action, and Society, Princeton: D. Van Nostrand Co., Inc., 1958.

McClelland, D. C., "Encouraging Excellence", in D. C. McClelland, The Roots of Consciousness, Princeton: D. Van Nostrand, Inc., 1964, pp. 46-61.

McClelland, D. C., "That Urge to Achieve", Think, 1966, 32, pp. 18-23.

Veroff, J., Atkinson, J. W., Feld, S. and Gurin, G., "The Use of Thematic Apperception to Assess Motivation in a Nationwide Interview Study", Psychological Monographs, 1960, 74, (12, whole no. 499).

Table 1. Description of Need Achievement Pictures*

Picture Number	For Boys		For Girls	
	Series I	Series II	Series I	Series II
1	Boy in Classroom (head up)	Boy in Classroom (head down)	Girl in Classroom (head up)	Girl in Classroom (head down)
2	Printshop (4 figures boss and 3 workers)	Printshop (2 figures boss and worker)	Office (4 figures boss and 3 workers)	Office (2 figures boss and worker)
3	Baseball Game (young man at bat, 2 girls watching)	Courtroom Scene (lawyer talking to jury)	Hostess - Dining Room (guests visible out-side)	Hostess - Kitchen (friend tasting food)
4	Laboratory (2 girls looking in Microscope	Laboratory (2 girls adjusting Water Jar	Laboratory (2 boys looking in Microscope	Laboratory (2 boys adjusting Water Jar

* Samples of these pictures are assembled in Appendix C, part 3.

Table 2. Summary of Means, S.D.'s, and Per Cent Achievement Imagery for Pictures in Series I and II by Sex-IQ Groups

SERIES I	Picture 1			Picture 2			Picture 3			Picture 4			Total	
	Mean	SD	% Imag	Mean	SD	% Imag	Mean	SD	% Imag	Mean	SD	% Imag	Mean	SD
Female Av IQ (n=30; Mean IQ= 102.4)	0.90	2.09	33	0.67	1.56	30	1.90	2.02	60	2.43	2.36	60	5.80	5.29
Female High IQ (n=16; Mean IQ= 132.9)	1.00	2.07	50	0.56	1.67	31	1.94	1.81	69	2.31	2.30	56	5.81	5.24
Male Av IQ (n=20; Mean IQ=102.9)	1.69	2.44	45	1.50	2.16	50	1.63	2.12	60	1.88	2.30	55	6.69	5.21
Male High IQ (n=19; Mean IQ=134.0)	1.31	2.18	37	0.56	1.41	26	0.69	1.45	42	2.13	1.99	63	4.69	4.37

(cont'd next page)

Table 2. Series II

SERIES II	Picture 1			Picture 2			Picture 3			Picture 4			Total	
	Mean	SD	% Imag	Mean	SD	% Imag	Mean	SD	% Imag	Mean	SD	% Imag	Mean	SD
Female Av IQ (n=21; Mean IQ= 107.1)	1.57	2.32	52	0.57	1.57	19	1.90	2.35	48	2.62	2.50	67	6.67	6.74
Male Av IQ (n=24; Mean IQ=102.6)	1.08	1.89	33	1.58	1.82	50	0.67	1.49	42	2.04	1.92	66	5.21	4.93

Table 3. Grades obtained by Average and High IQ Ss and the Relation of n Ach Scores to Two Performance Measures

	Grades+		Correlations of n Ach with	
	Mean	S.D.	Grades+	Anagrams
Female-Av. IQ (n = 30)	6.23	2.05	.19	.42*
Female-High IQ (n = 16)	7.75	1.57	.72*	.16
Male-Av. IQ (n = 20)	5.94	1.95	.45	.52*
Male-High IQ (n = 16)	7.56	1.10	-.08	-.56*

+ Sum of grades in English and Social Studies

* Significant at or beyond .05

Table 4. Mean n Ach Scores of Ss Attaining Different Levels of Performance in English and Social Studies

Sum of Grades	High IQ Girls		(n)	High IQ Boys		(n)	Av. IQ Girls		(n)	Av. IQ Boys		(n)
10	6	9.6	(3)	-		-	7	9	(1)	-		-
9	11.5		(2)	6.5		(2)	10		(2)	12		(1)
8	5.8		(5)	3		(9)	7.1		(7)	8		(2)
7	3.7		(3)	5.6		(4)	5.1		(6)	10		(5)
6	2.5		(2)	1.3		(4)	-0.5		(2)	5		(3)
5	1.0		(1)	13.0		(1)	7.4		(5)	2.0		(4)
4	-		-	-		-	4.0		(4)	-		-
3	-		-	-		-	6.5		(2)	0.0		(1)
2	-		-	-		-	1.0		(1)	0.0		(1)
1												
0												

Table 5. Brief Description of Beswick's Curiosity Scoring Scheme

(Each story can get a score of 0 to 5. The total score is the sum for four stories)

1. Wonder-interest
   Some idea or object is the focus of interested attention.

   Ex. "He is fascinated by the rock."

2. Perceptual investigation
   Any sensory behavior which has the general goal of finding out something.

   Ex. listening, trying to hear, staring, touching

3. Exploratory role behavior
   Someone is in a culturally defined exploratory role (scientist, archaeologist) and details of the exploratory behavior are given.

   Or, minus an "official" role, someone has exploratory interests.

   Ex. "Let's see what's in the attic."

4. Cue-response sequence
   An idea or object specifically described as strange, novel, is followed by (a) overt responses (other than perceptual or cognitive) such as approaching, asking, et al.; or (b) covert responses like excitement, desire to find out

5. Cognitive acts
   Someone tries to investigate a specific problem; tries to unearth new information about it; makes guesses, devises hypotheses.

   Ex. "That boy may have put the saddle on the cow. Or maybe the cow grew up in a stable and thinks he is a horse."

N.B: Table 5 cont'd

Categories 1-4 involve "openness to experience"; categories 4 and 5 deal with attempts to digest and incorporate experience.

Table 6. Brief Description of Greenberger's "Need to Know"*

(Each story can be scored from 0 to 12. The total score is the sum for four pictures.)

+1 Cognitive imagery
Someone is trying to locate a problem, or solve one. Concern with finding out, figuring out, learning.

Ex. "He is trying to figure out where this rock came from."

+1 Need
Explicitly stated need to know

Ex. "He wants the answer."

+1 Instrumental activity
Behavior directed towards attaining the goal.

Ex. "He compares it with some pictures of similar specimens."

+1 Positive goal anticipation
Someone anticipates satisfaction of an attempt to pose or solve a problem.

Ex. "He thinks he will have the answer soon."

+1 Negative goal anticipation
Someone anticipates frustration of an attempt to pose or solve a problem.

Ex. "He is afraid he will not be able to put the pieces of the puzzle together."

+1 Block: personal
Factors within the person block the problem-finding or solving.

Ex. "He doesn't have the knowledge or training to get the answer."

Table 6 cont'd

+1 Block: world
Factors external to the person create the block.

Ex. "The book he needs for reference is missing from the library."

+1 Nurturant press
Someone aids or is sympathetic to the wish to know.

Ex. "A friend who is also interested in rocks lends him some other books."

+1 Goal satisfaction: positive
Feels good on locating or solving a problem

Ex. "He experiences a tremendous sense of pleasure when he sees the answer in front of him."

+1 Goal satisfaction: negative
Feels bad on failing to locate or solve problem

Ex. "He is worn out and depressed when he can't find out what he was looking for."

+1 Excitement
Expressions indicating strong positive affect in connection with looking for or working on problems

Ex. "He can't wait to get to work on the problem and puts everything else aside."

+1 Curiosity theme
The need to know is the main and usually the only theme of the story.

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* Adapted from McClelland's et al (1953) System for measuring motivation to achieve.

Table 7. Need Achievement as Affected by Sex and IQ

Source of Variation	d.f.	M.S.	Significance Level
IQ (high vs. medium)	1	7	N.S.
Sex	1	4	N.S.
IQ x Sex	1	48	N.S.
Residual	60	23.0	N.S.

Table 8. Correlations of n Ach with Two Measures of Curiosity and Three Scores from the Crandall Scale

Sex and IQ Groups	n	Curiosity		Crandall		
		Beswick	Greenberger	Total Score	Success Subscale	Failure Subscale
Female Av IQ	30	.33	.14	.08	.05	.19
Female High IQ	16	.18	.27	.27	.01	.28
Male Av IQ	16	.33	.16	.22	.01	.25
Male High IQ	16	.28	.01	.53*	.51*	.00

* $p < .05$

Table 9. Means and Standard Deviations of Total and Subscale Scores for the Crandall Scale and their Correlation with Two Measures of Curiosity

		Score on Total Crandall				Crandall Success Subscale				Crandall Failure Subscale			
Av IQ	n	Mean	SD	Beswick	Greenberger	Mean	SD	Beswick	Greenberger	Mean	SD	Beswick	Greenberger
Girls	44	24.84	3.41			12.61	3.03			12.23	1.96		
Boys	41	22.40	5.09			11.73	2.30			10.68	3.26		
Girls + Boys	85			.09	.06			.02	.09			.16	.04
High IQ													
Girls	16	24.37	2.96			12.63	2.25			11.75	2.08		
Boys	19	21.44	5.29			12.71	1.85			10.05	4.78		
Girls + Boys	35			.01	.12			.02	.14			.00	.11

Table 9. Means and Standard Deviations of Two Measures of Curiosity and the Correlation of Curiosity with Grades

Sex and I.Q. Group	Beswick Mean	Beswick S.D.	Beswick Correl. Grades	Greenberger Mean	Greenberger S.D.	Greenberger Correl. Grades
Female Av. I.Q.	3.50	1.90	.16	5.97	3.45	.07
Female High I.Q.	3.75	1.53	-.22	6.44	2.42	.12
Male Av. I.Q.	3.63	2.08	.50*	6.56	2.83	.34
Male High I.Q.	3.81	1.90	.35	6.75	3.07	.27

*$p < .05$

Appendix A

McClelland's Scoring Scheme for Need Achievement

COMPONENTS OF McCLELLAND'S n ACHIEVEMENT SCORE

-1 UI — Story contains imagery unrelated to achievement as defined in AI. Score no further.

Ex. "He is bored with studying and wishes he were somewhere else."

0 TI — Story concerns performance of routine tasks or a "task attitude" towards some activity. Score no further.

Ex. "He is studying and will continue until he finishes the assignment."

+1 AI — Story contains achievement imagery: competition with an explicitly stated standard of excellence; or, efforts or thoughts concerning an unique accomplishment (e.g., invention); or, efforts or thoughts concerning some long-term goal the attainment of which would represent an accomplishment (e.g., career).

Ex. "He is studying in order to earn a high grade on the final exam."
Ex. "He has closed his book and is dreaming, 'maybe someday I will find the cure for cancer'."
Ex. "He studies hard so that he can go to college one day."

+1 N — Explicitly stated need to succeed or perform well.

Ex. "He wants to do better than he did on the last exam."

+1 I — Instrumental activity engaged in to reach the goal.

Ex. "He concentrates hard on what he is reading and writes down questions to ask the teacher."

+1 Bw World block. Events in the world block his achievement striving.

Ex. "The teacher will not answer his questions and tells him to figure them out himself."

+1 Bp Personal Block. Events within the person block his achievement.

Ex. "He isn't able to figure out all the questions."

+1 Ga^{+} Goal-anticipation: expects success.

Ex. "He feels he'll do well on the test."

+1 Ga^{-} Goal-anticipation: expects failure.

Ex. "But he is still worried that the test may be too hard for him."

+1 Nup Nurturant press. Someone aids, is sympathetic to, the achievement strivings.

Ex. "His mother makes the other kids be quiet so he can get in a little reviewing at home."

+1 G+ Goal behavior: pleasure on attaining goal.

Ex. "He's on cloud 9 when he gets back an A."

+1 G- Goal behavior: displeasure on failing to reach goal.

Ex. "He is very upset when he gets his test back with a C."

+1 A th Achievement thema. Achievement is the major, usually the only, theme of the story.

Appendix B

Example of Pictures Used by Veroff, Atkinson, Feld and Gurin to Measure n Ach

Appendix C

Test Materials for Second Session

1. Achievement-arousal procedure: anagrams and scrambled words
2. Story-writing procedure
3. Two pictures from one set developed by Greenberger and Entwisle for measuring n Ach
4. Partial Crandall IAR Scale

The test which you are now going to take indicates in general a person's level of intelligence. It is part of a group of tests which were used to select young men and women for top career positions - positions as leaders and directors in their fields of work. This test in addition to telling us about a person's general intelligence brings out a person's ability to organize ideas and to size up situations quickly and accurately. In other words, this test gives some indication of whether or not a person is suited to be a leader in whatever field he or she chooses. This research is being carried out to find out just which individuals have leadership ability, even though they may not have had the opportunity or the time yet to become leaders.

The test is called an anagrams test. You will be given a "key" word and you are to make as many words as you can out of the word given. The only rules are:

1. Make words at least 3 letters long.
2. Do not make people's names (Bob, Carol, Jones).
3. Do not use a letter more times than it appears in the key word.
4. If you make a singular word like "call", don't also make "calls", or if you start by making "calls", don't use "call".

1

generation

Print your name _____

The next is a "scrambled words" test. Each group of letters will form a word if it is arranged correctly. You are to rearrange the letters and find the word. Then write it in the space provided.

Examples:

KILM	M I L K
LAISTBOA	S A I L B O A T

You will have 3 minutes for this test. When the signal is given, turn the page and begin.

Practice:

Keyword: graduate

Words you might make: date, tea, grade, etc.

When the signal is given, you will turn the page to the key word. You will have three minutes to make as many words as you can.

1

SCRAMBLED WORDS

EXMA	_ _ _ _
BIDLU	_ _ _ _ _
CARYR	_ _ _ _ _
PRTTEY	_ _ _ _ _ _
MEMRBEER	_ _ _ _ _ _ _ _
TIMPRONAT	_ _ _ _ _ _ _ _ _
FISHIN	_ _ _ _ _ _
DARMSCLBE	_ _ _ _ _ _ _ _ _
AKNEWA	_ _ _ _ _ _
EPLAP	_ _ _ _ _
PLUOPRA	_ _ _ _ _ _ _
SEMOOLEN	_ _ _ _ _ _ _ _

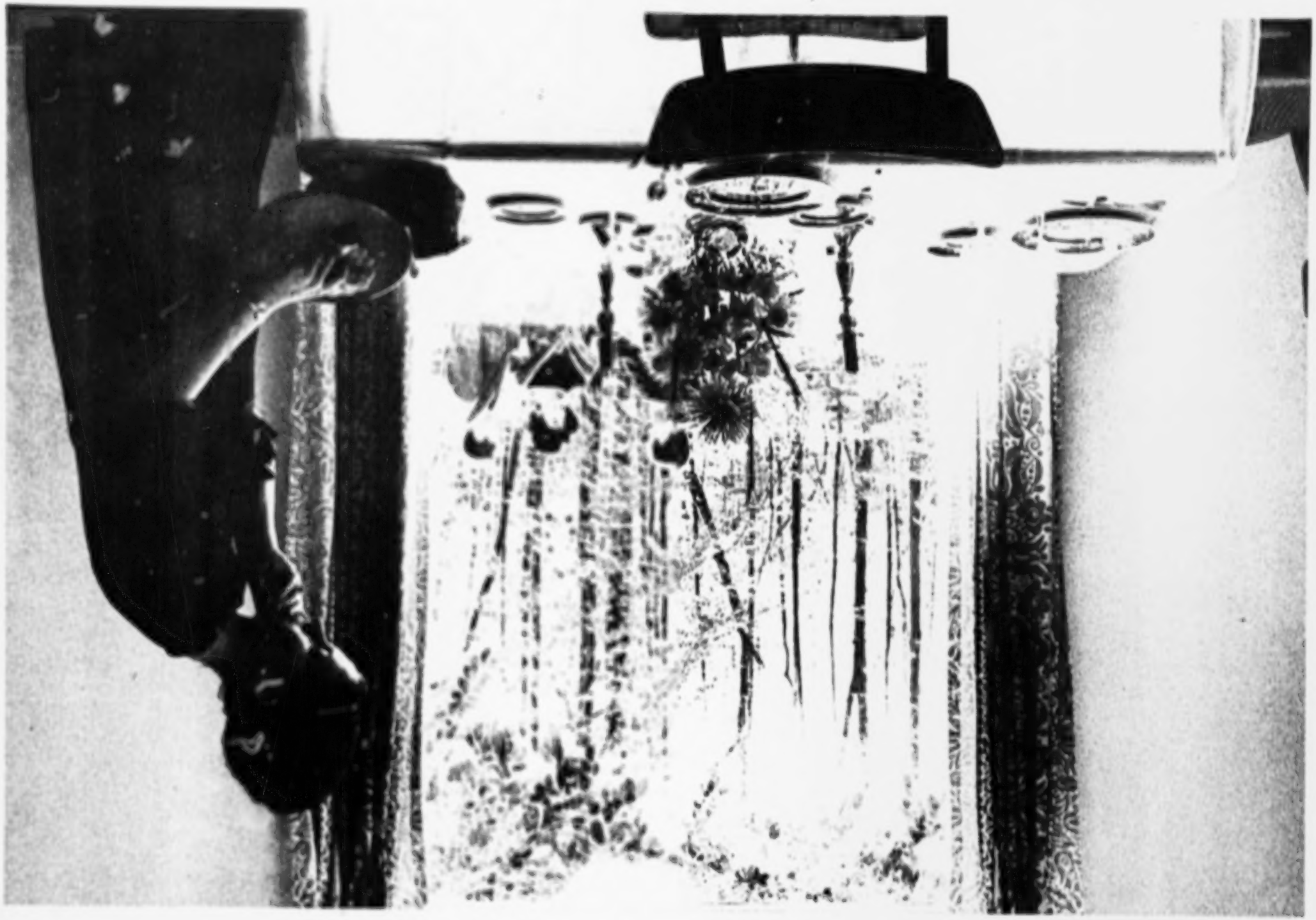
This is a test of your creative imagination. This booklet contains a number of pictures. (Do not look at them now, please.) You will have 20 seconds to look at each picture, and then about four minutes to make up a story about it. You will find two pages after each picture. <u>One</u> of the pages is for writing your story. The same four questions are asked on each story-writing page. The <u>empty</u> page is just to cover the next picture until I give the signal to go on.

1. What is happening? Who are the persons?
2. What has led up to this situation? That is, what has happened in the past?
3. What is being thought? What is wanted? By whom?
4. What will happen? What will be done?

These questions will guide your thinking and help you to cover all the parts of a plot in the time given. Plan to spend about a minute on each question. I will keep time and tell you when it is about time to go on to the next question for each story. You will have a little time to finish your story before I tell you to go on to the next picture. Do not go on to the next picture until I give the signal.

Obviously there are no right or wrong answers, so you may feel free to make up any kind of a story about the pictures that you choose. Try to make them interesting and dramatic,

for this is a test of <u>creative imagination</u>. Do not merely describe the picture you see. Tell a story about it. Work as fast as you can in order to finish in time. Make them interesting. Are there any questions? If you need more space for any question, use the reverse side of the story-writing page.



Cyclops

Below are questions or statements. For each one, two possible answers are given. Put a checkmark before the answer that best describes what happens to you or how you feel. There are no right or wrong answers. Your answers will not be shown to anyone in your school or anyone connected with the school.
REMEMBER - Choose one and only one alternative for each question.

1. When you do well on a test at school, is it more likely to be
_____a. because you studied for it, or
_____b. because the test was especially easy?

2. If your parents tell you you're acting silly and not thinking clearly, is it more likely to be
_____a. because of something you did, or
_____b. because they happen to be feeling cranky?

3. When you win at a game of cards or checkers, does it happen
_____a. because you play real well, or
_____b. because the other person doesn't play well?

4. Suppose your parents say you aren't doing well in school. Is this more likely to happen
_____a. because your work isn't very good, or
_____b. because they are feeling cranky?

5. When you have trouble understanding something in school, is it usually
_____a. because the teacher didn't explain it clearly, or
_____b. because you didn't listen carefully?

6. Suppose you became a famous teacher, scientist or doctor. Do you think this would happen

_____a. because other people helped you when you needed it, or

_____b. because you worked very hard?

7. Suppose you are showing a friend how to play a game and he has trouble learning. Would that happen

_____a. because he wasn't able to understand how to play, or

_____b. because you couldn't explain it well?

8. If a boy or girl tells you that you are bright, is it usually

_____a. because you thought up a good idea, or

_____b. because they like you?

9. If a teacher says to you, "Your work is fine", is it

_____a. something teachers usually say to encourage pupils, or

_____b. because you did a good job?

10. If you can't work a puzzle, is it more likely to happen

_____a. because you are not especially good at working puzzles, or

_____b. because the instructions weren't written clearly enough?

11. If a teacher promotes you to the next grade, would it probably be

_____a. because the teacher liked you, or

_____b. because of the school work you did?

12. When you read a story and remember most of it, is it usually

_____a. because you were interested in the story, or

_____b. because the story was well written?

13. If people don't think you're bright or clever
_____a. can you make them change their mind if you try to, or
_____b. are there some people who will think you're not very bright no matter what you do?

14. Suppose you don't do as well as usual in a subject at school. Would this probably happen
_____a. because you weren't as careful as usual, or
_____b. because somebody bothered you and kept you from working?

15. When you remember something you heard in class, is it usually
_____a. because you tried hard to remember, or
_____b. because the teacher explained it well?

16. Suppose you're not sure about the answer to a question your teacher asks you and the answer you give turns out to be wrong. Is it likely to happen
_____a. because she was more particular than usual, or
_____b. because you answered too quickly?

17. When you find it easy to work arithmetic or math problems at school, is it usually
_____a. because the teacher gave you especially easy problems, or
_____b. because you studied your book well before you tried them?

Appendix D

Test Materials for First Session

1. Story-writing procedure
2. Sample picture (Beswick) used for measuring curiosity
3. Sample picture (Greenberger and Entwisle) being evaluated for use in measuring curiosity
4. Remainder of Crandall IAR Scale

I think you will enjoy what we are going to begin with today. A group of people are collecting stories made up by young people. They want to know what kind of stories boys and girls your age can make up on their own when they really let their imagination go. They would appreciate your helping them by writing some imaginative stories.

I have some pictures to show you to help you get started. You can build each story around a picture. I will pass out a booklet containing 6 pictures, for basing 6 stories on, in a few moments.

It will help you to think out your stories if you ask yourself when you look at the pictures:

What is going on? Who are the people?
What happened in the past to lead up to this situation?
What are the people thinking?
Do any of them want anything? What do they want?
What will happen afterwards? What will be done?

Now don't just stick to answering these questions. They are only a guide. Your imagination will supply the rest.

You don't have to worry about spelling and grammar. The stories will not be given a grade or anything of the sort, and no one connected with the school will see them. We are

only interested in the type of stories boys and girls of your age can think up.

There are no right or wrong kinds of stories. Any kind of story is all right. Don't just describe how the picture looks, but write the story that comes to your mind when you look at the picture.

Remember, a story should have a beginning, a middle, and an end. You will need to write quickly because you will have only 5 minutes to write a story for each picture. I will tell you when the time is nearly up. Then try to finish off and tell us how it ends. If you don't finish by the time I say 'stop' you will have a little time later to go back and finish it. We will begin each story on a new page. The important thing is to write an interesting and imaginative story which you make up yourself.

Print your name _____

Below are questions or statements. For each one, two possible answers are given. Put a checkmark before the answer that best describes what happens to you or how you feel. There are no right or wrong answers. Your answers will not be shown to anyone in your school or anyone connected with the school.

REMEMBER - Choose one and only one alternative for each question.

1. When you don't do well on a test at school, is it
   _____a. because the test was especially hard, or
   _____b. because you didn't study for it?

2. If your parents tell you that you are bright or clever is this
   _____a. because they are feeling good, or
   _____b. because of something you did?

3. When you lose at a game of cards or checkers, does it usually happen
   _____a. because the other player is good at the game, or
   _____b. because you don't play well?

4. Suppos your parents say you are doing well in school. Is this likely to happen
   _____a. because your school work is good, or
   _____b. because they are in a good mood?

5. When you learn something easily in school, is it usually
   _____a. because you paid close attention, or
   _____b. because the teacher explained it clearly?

6. Suppose you study to become a teacher, scientist, or doctor and you fail. Do you think this would happen

_____a. because you didn't work hard enough, or

_____b. because you needed some help, and other people didn't give it to you?

7. Suppose you are explaining how to play a game to a friend and he learns quickly. Would that happen more often

_____a. because you explained it well, or

_____b. because he was able to understand it?

8. If a boy or girl tells you that you are dumb, is it more likely that they say that

_____a. because they are mad at you, or

_____b. because what you did really wasn't very bright?

9. If a teacher says to you, "Try to do better," would it be

_____a. because this is something she might say to get pupils to try harder, or

_____b. because your work wasn't as good as usual?

10. If you solve a puzzle quickly, is it

_____a. because it wasn't a very hard puzzle, or

_____b. because you worked on it carefully?

11. If a teacher didn't promote you to the next grade, would it probably be

_____a. because she "had it in for you", or

_____b. because your school work wasn't good enough?

12. When you read a story and can't remember much of it, is it usually

_____a. because the story wasn't well written, or

_____b. because you weren't interested in the story?

13. If people think you're bright or clever, is it

_____a. because they happen to like you, or

_____b. because you usually act that way?

14. Suppose you did better than usual in a subject at school. Would it probably happen

_____a. because you tried harder, or

_____b. because someone helped you?

15. When you forget something you heard in class, is it

_____a. because the teacher didn't explain it very well, or

_____b. because you didn't try very hard to remember?

16. Suppose you weren't sure about the answer to a question your teacher asked you, but your answer turned out to be right. Is it likely to happen

_____a. because she wasn't as particular as usual, or

_____b. because you gave the best answer you could think of?

17. When you find it hard to work arithmetic or math problems at school, is it

_____a. because you didn't study well enough before you tried them, or

_____b. because the teacher gave problems that were too hard?

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200 Ellen Greenberger and Doris R. Entwisle

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600 achievement motivation, curiosity, Crandall's IAR scale (sense of control for
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602 high IQ, grades, anxiety about failure, projective test
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IDENTIFIERS

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ABSTRACT

800 The Introduction reviews a number of findings and problems in the
801 measurement of achievement motivation and raises some questions concerning
802 the possible friction between motivation to achieve and curiosity.
803 Subjects for the two pilot studies were 9th graders of average (95-113)
804 and high IQ (128 +) from a predominantly upper middle class Jewish public
805 high school. The first study explores the properties of a set of pictures
806 newly developed to measure n Ach. These pictures--separate ones for males &
807 females--display attractive persons in up-to-date academic, vocational, &
808 recreational situations. The results indicate that (1) the new pictures
809 evoke achievement imagery in amounts and ranges recommended by previous
810 investigators; (2) n Ach scores from these pictures relate somewhat better to
811 grades than scores from other pictures; (3) concern about failure probably
812 interacts with n Ach to affect academic performance; (4) concern about failure
813 seems especially high in average IQ girls and high IQ boys from this milieu;
814 (5) n Ach, curiosity and sense of control are essentially uncorrelated and
815 are likely to stem from different socialization practices.
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